

# 第 1604 回 天文学教室談話会

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東京大学理学部 1 号館西棟 11 階 1109 号室 (天文学専攻会議室) にて

“The Atomic-to-Molecular (HI-to-H<sub>2</sub>) Transition in Galaxy Star-Forming Regions”

Amiel Sternberg (Tel Aviv University)

The atomic-to-molecular (HI-to-H<sub>2</sub>) phase transition is of fundamental importance for regulating star-formation in galaxies. I will describe new analytic theory for interstellar HI-to-H<sub>2</sub> transitions, based on fundamental physical principles. I will discuss my general-purpose formula for the total HI mass surface densities produced by photodissociation in optically thick media, valid for beamed or isotropic radiation, gradual to sharp transitions, and for arbitrary metallicity. The general theory may be broadly applied for interpreting observations of atomic and molecular gas in individual Galactic sources, for setting star-formation thresholds, for understanding global galaxy properties on large scales, and may also be incorporated into hydrodynamics simulations.